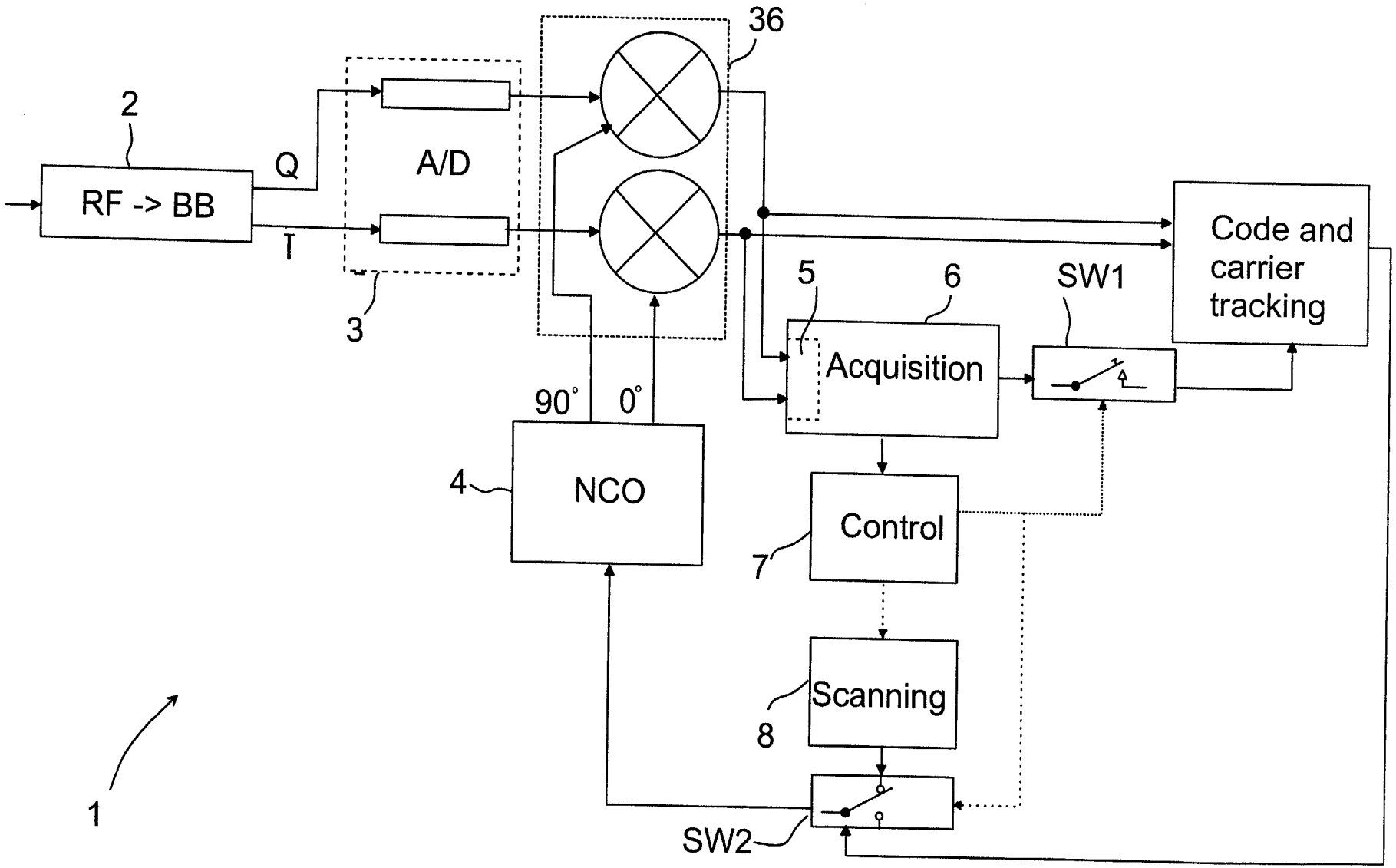
36
2
RF -> BB
Q
I
A/D
3
5
6
SW1
Code and carrier tracking
Acquisition
90°
0°
4
NCO
Control
7
Scanning
8
1
SW2

Fig. 1a

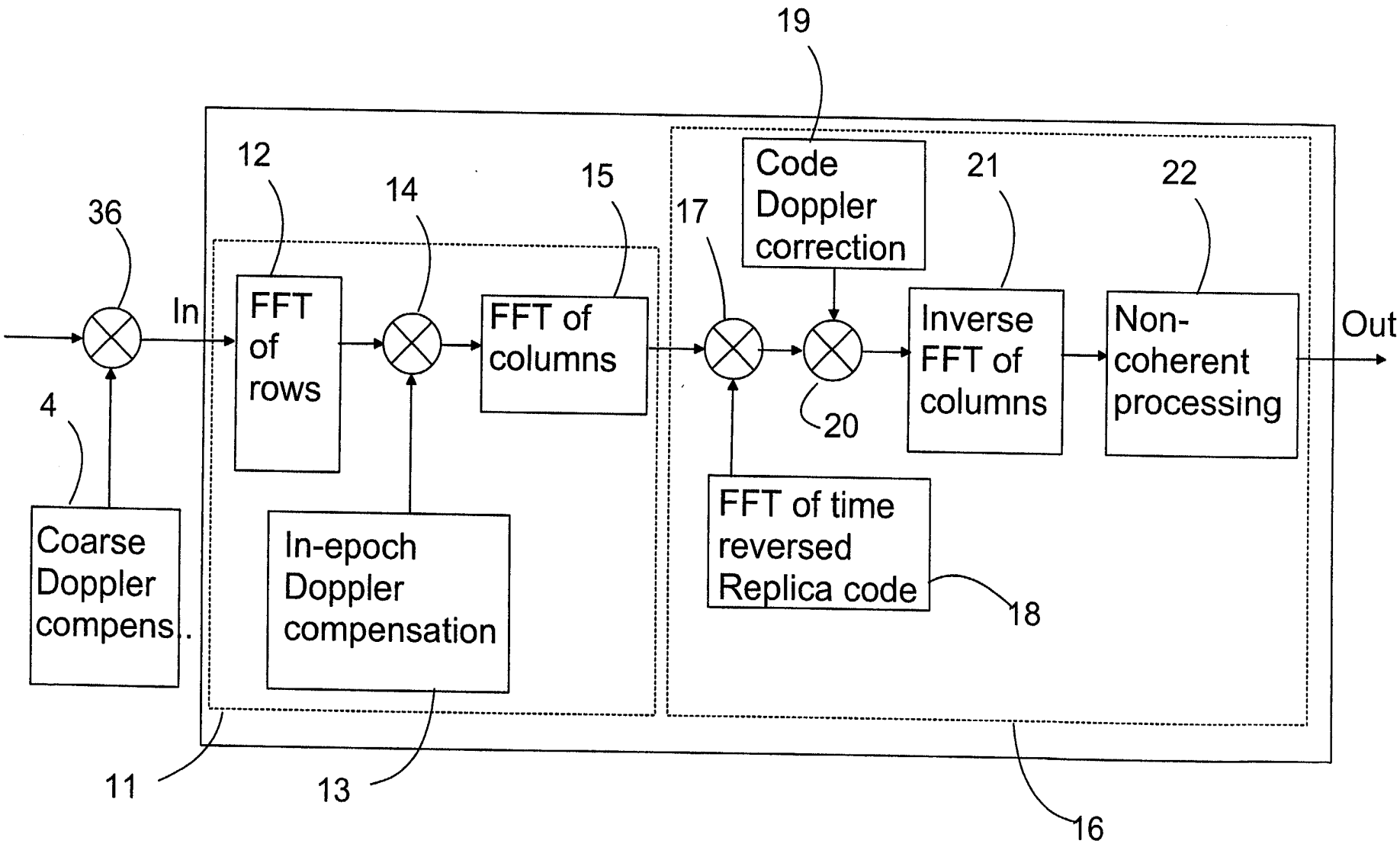
19
12
14
15
17
Code
Doppler
correction
21
22
36
In
FFT
of
rows
FFT of
columns
Inverse
FFT of
columns
Non-
coherent
processing
Out
4
20
Coarse
Doppler
compens..
In-epoch
Doppler
compensation
FFT of time
reversed
Replica code
18
11
13
16

Fig. 1b

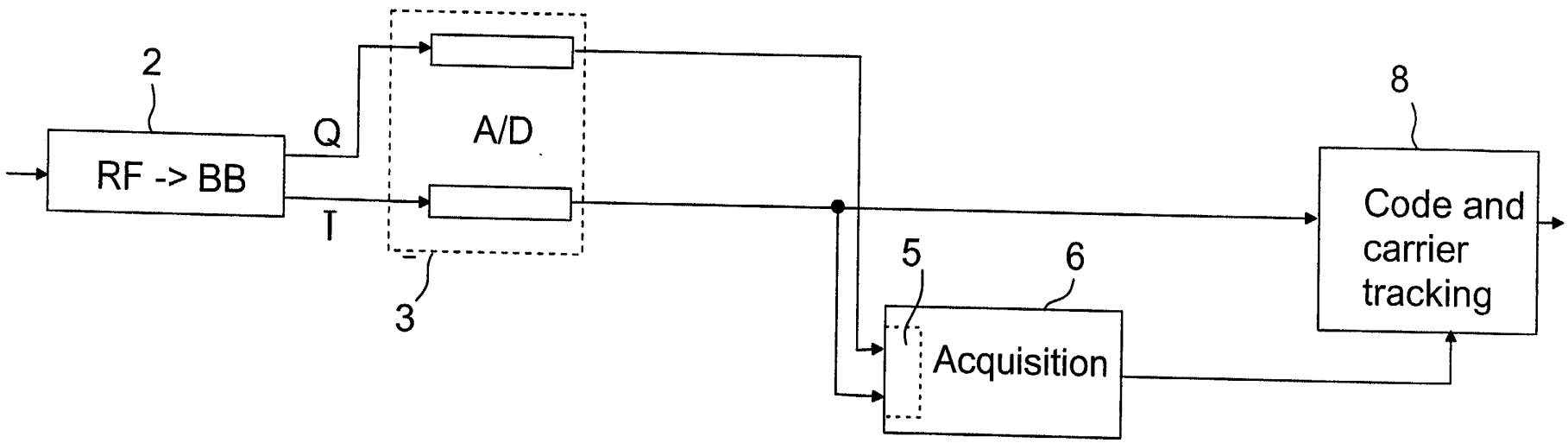

Fig. 1c

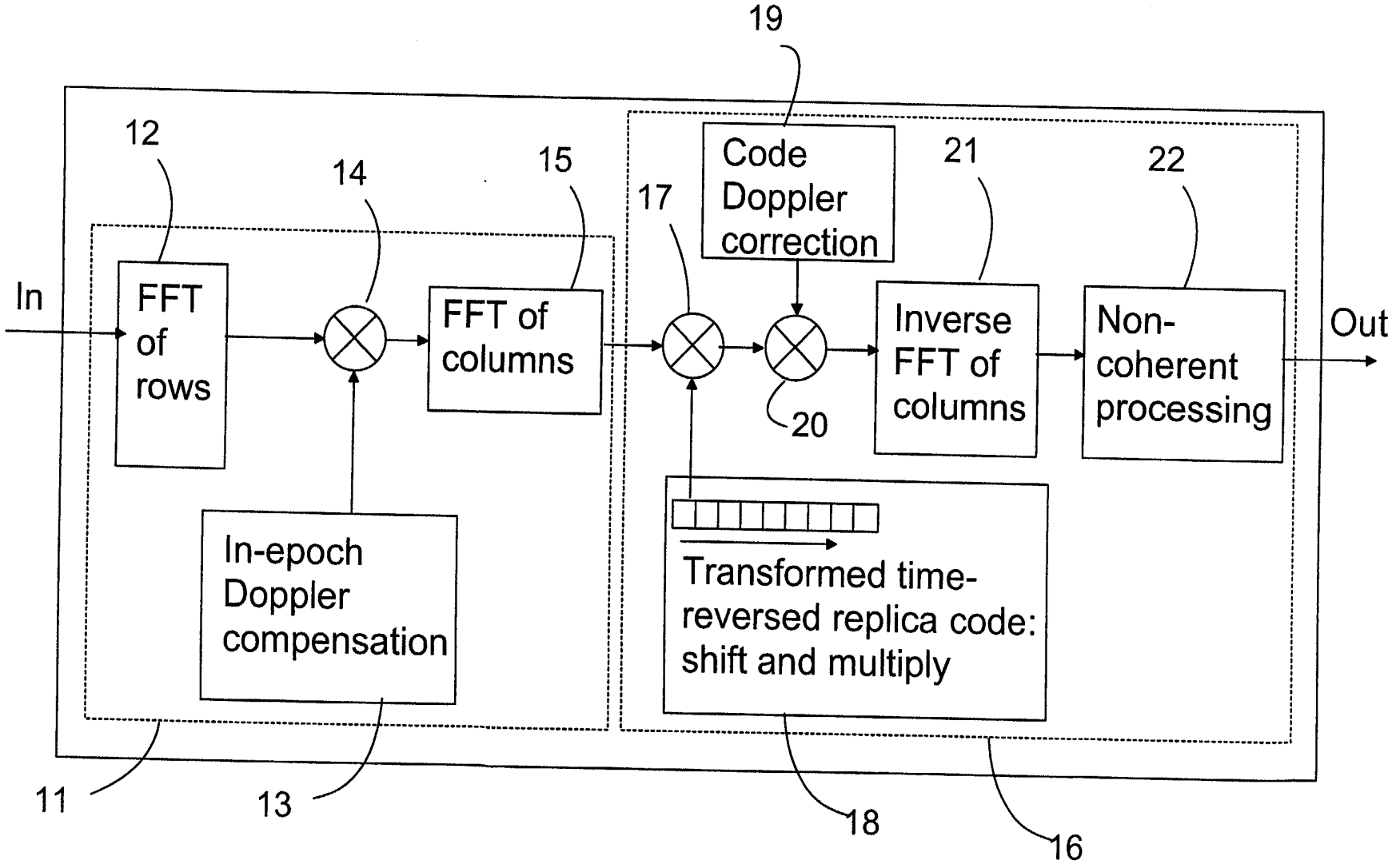
19
12
14
15
17
Code Doppler correction
21
22
In
FFT of rows
FFT of columns
Inverse FFT of columns
Non-coherent processing
Out
20
In-epoch Doppler compensation
Transformed time-reversed replica code: shift and multiply
11
13
18
16

Fig. 1d

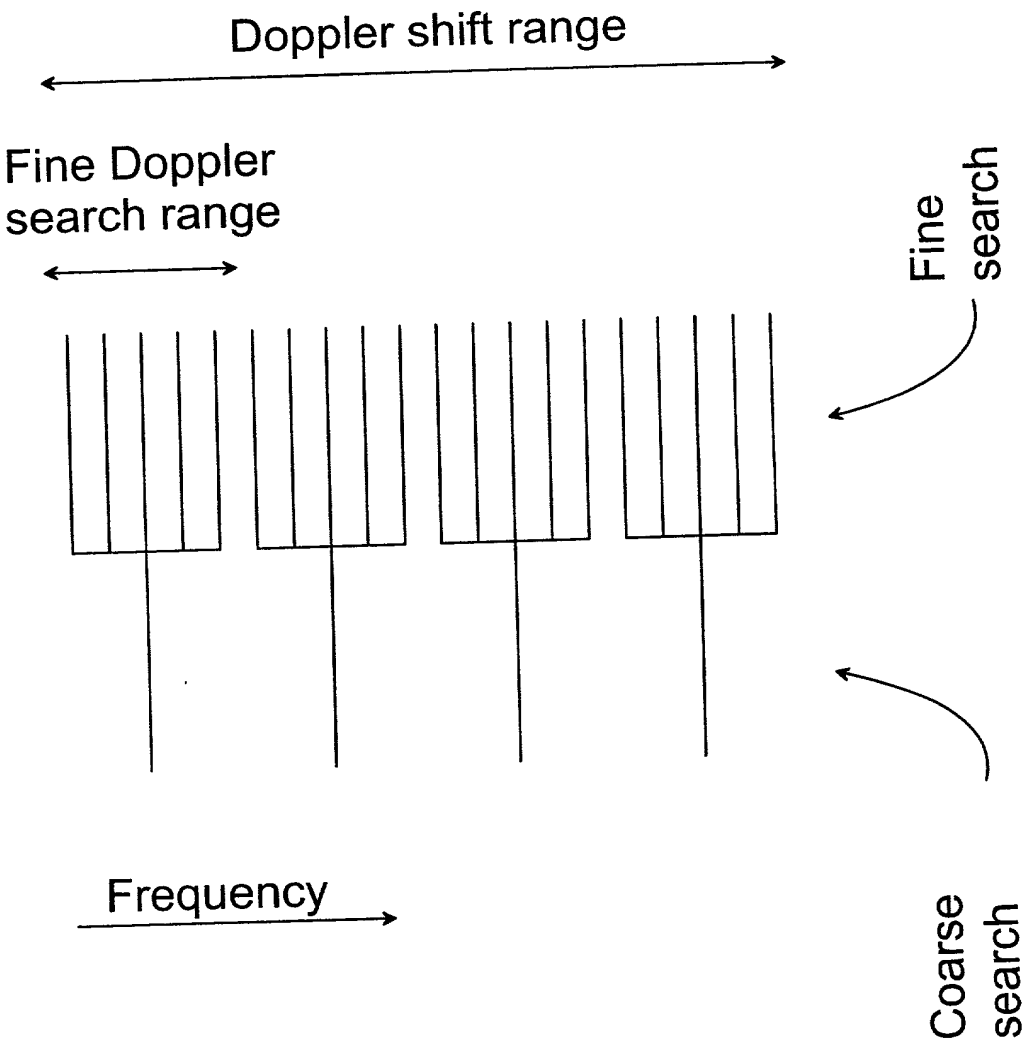
Doppler shift range
Fine Doppler
search range
Fine
search
Frequency
Coarse
search

Fig. 2a

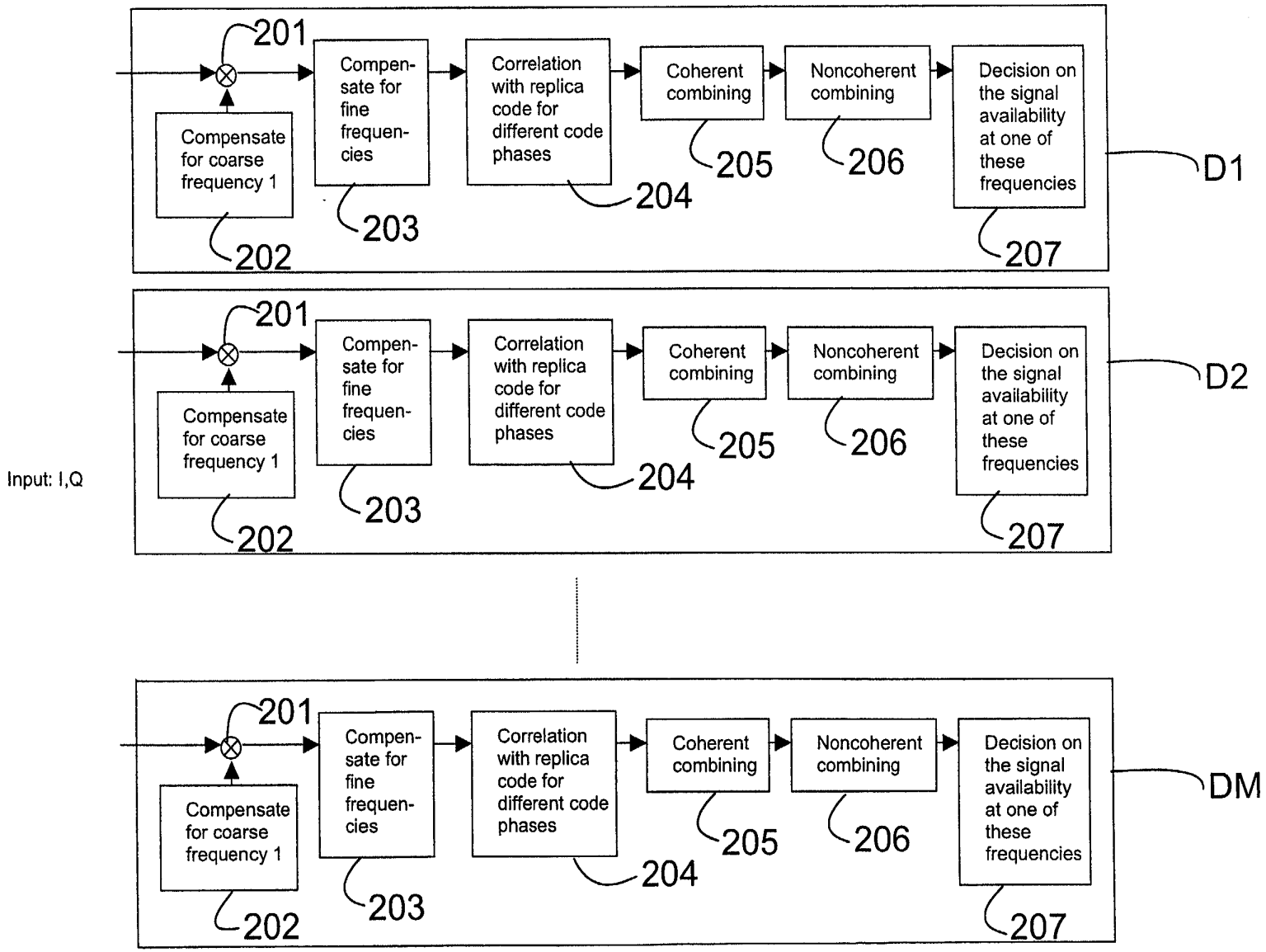

Fig. 2b

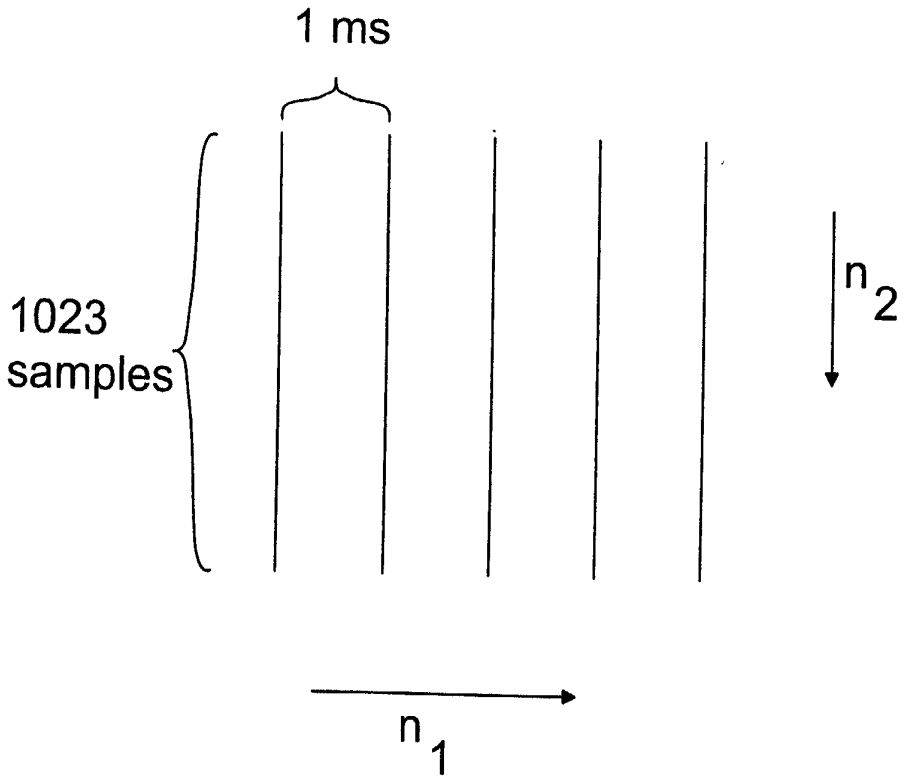

Fig. 3

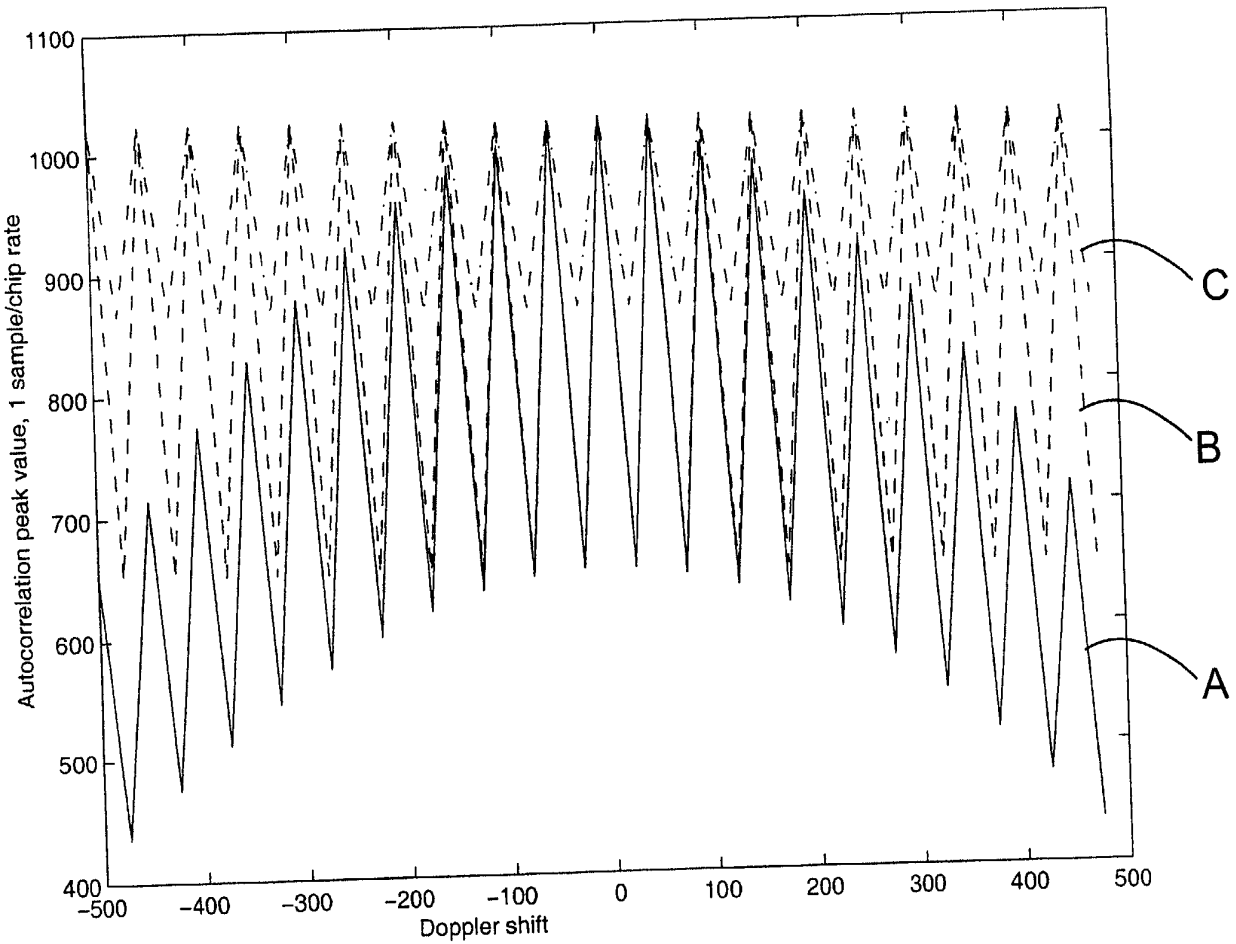
1100
1000
900
800
700
600
500
400
Autocorrelation peak value, 1 sample/chip rate
−500
−400
−300
−200
−100
0
100
200
300
400
500
Doppler shift
C
B
A

Fig. 4

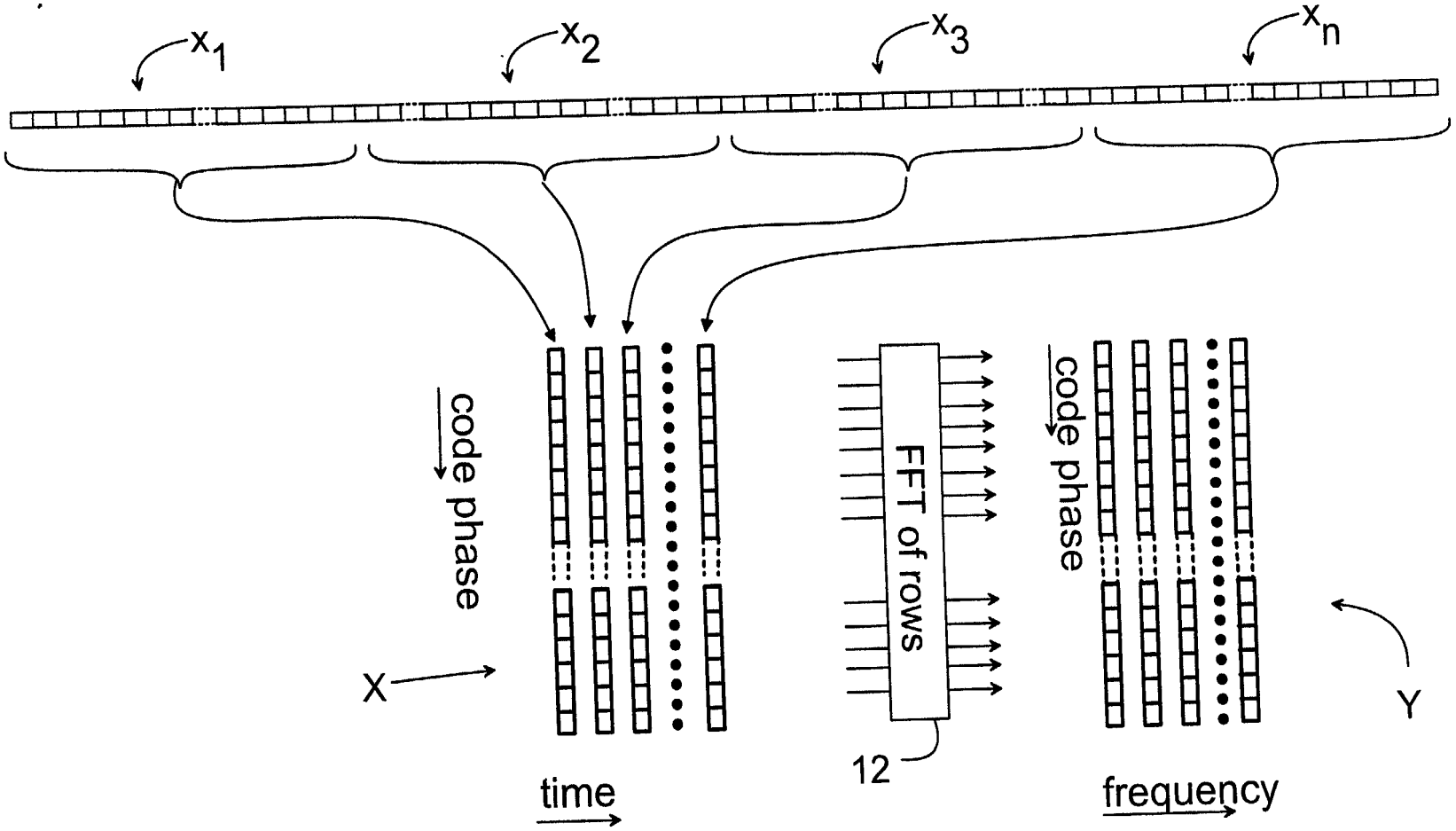
x1
x2
x3
xn
code phase
X
time
FFT of rows
12
code phase
Y
frequency

Fig. 5

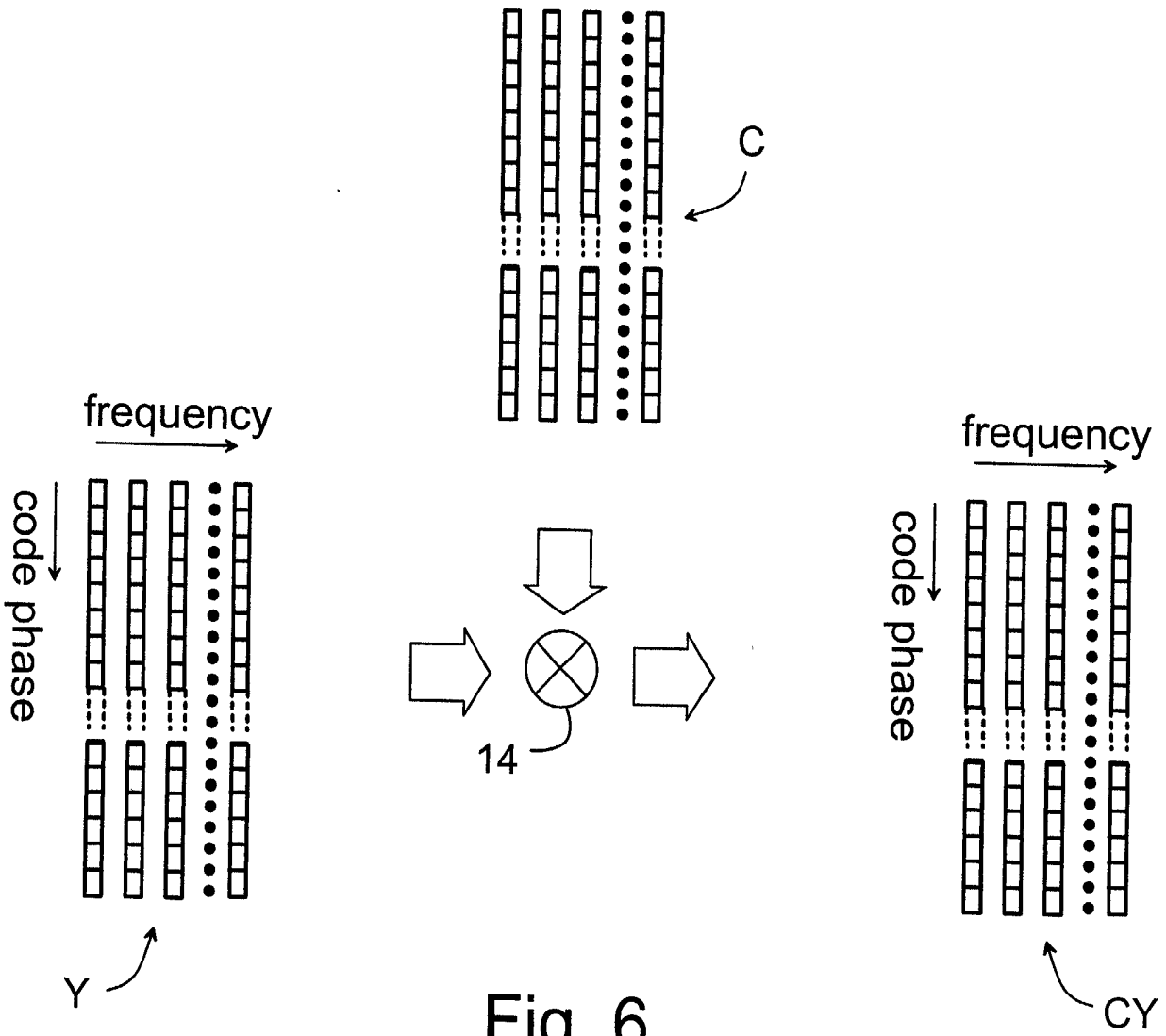

Fig. 6

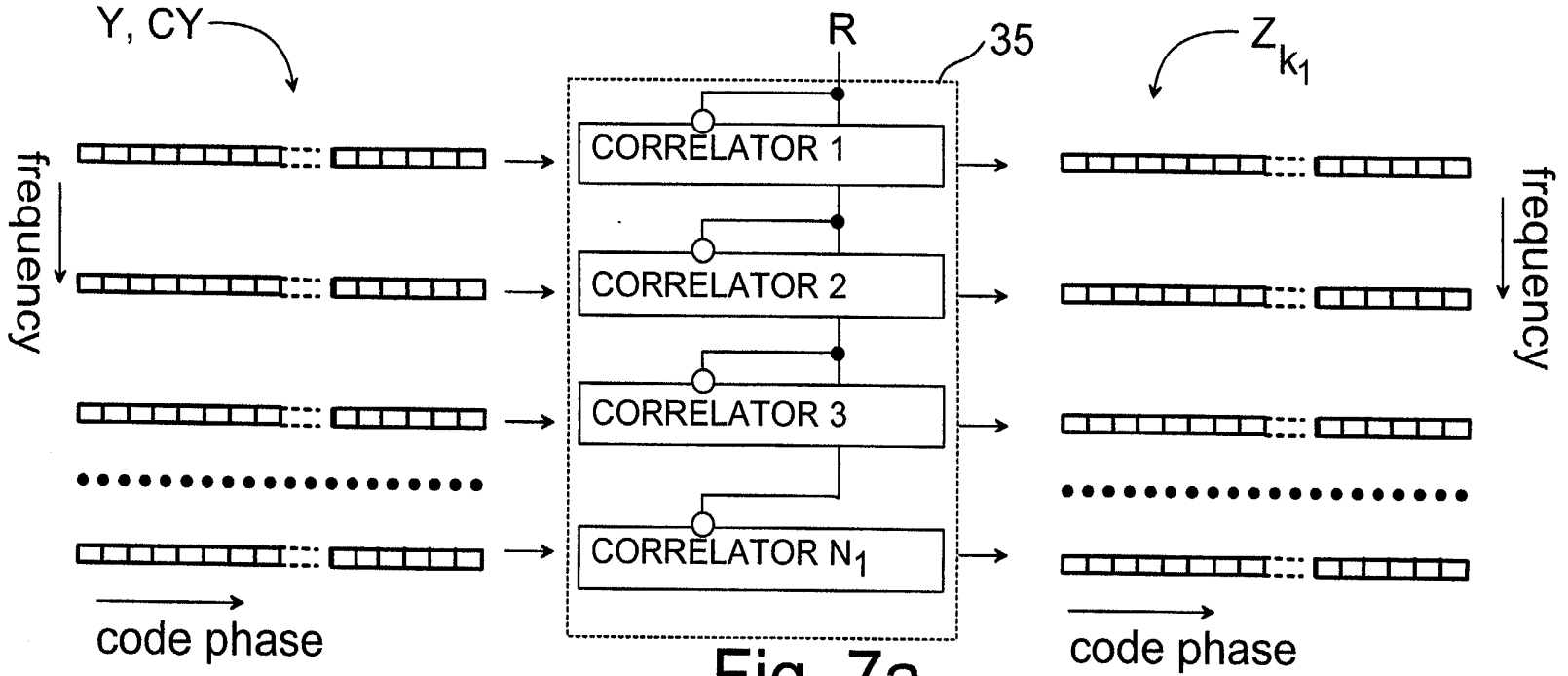
Y, CY
R
35
Z_{k_1}
CORRELATOR 1
CORRELATOR 2
CORRELATOR 3
CORRELATOR N_1
frequency
frequency
code phase
code phase

Fig. 7a

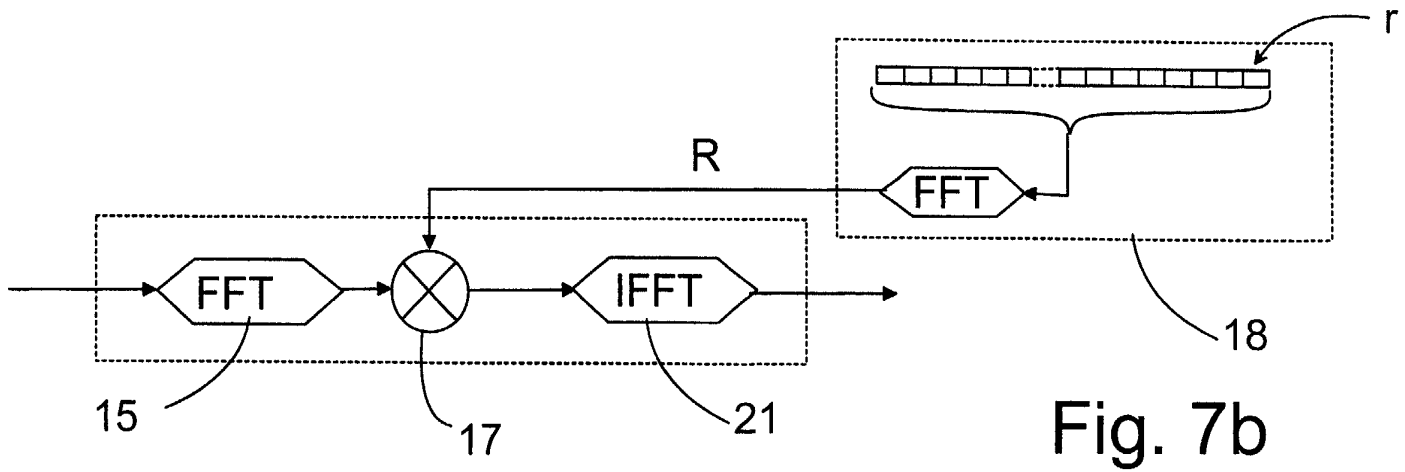
r
R
FFT
FFT
IFFT
15
17
21
18

Fig. 7b

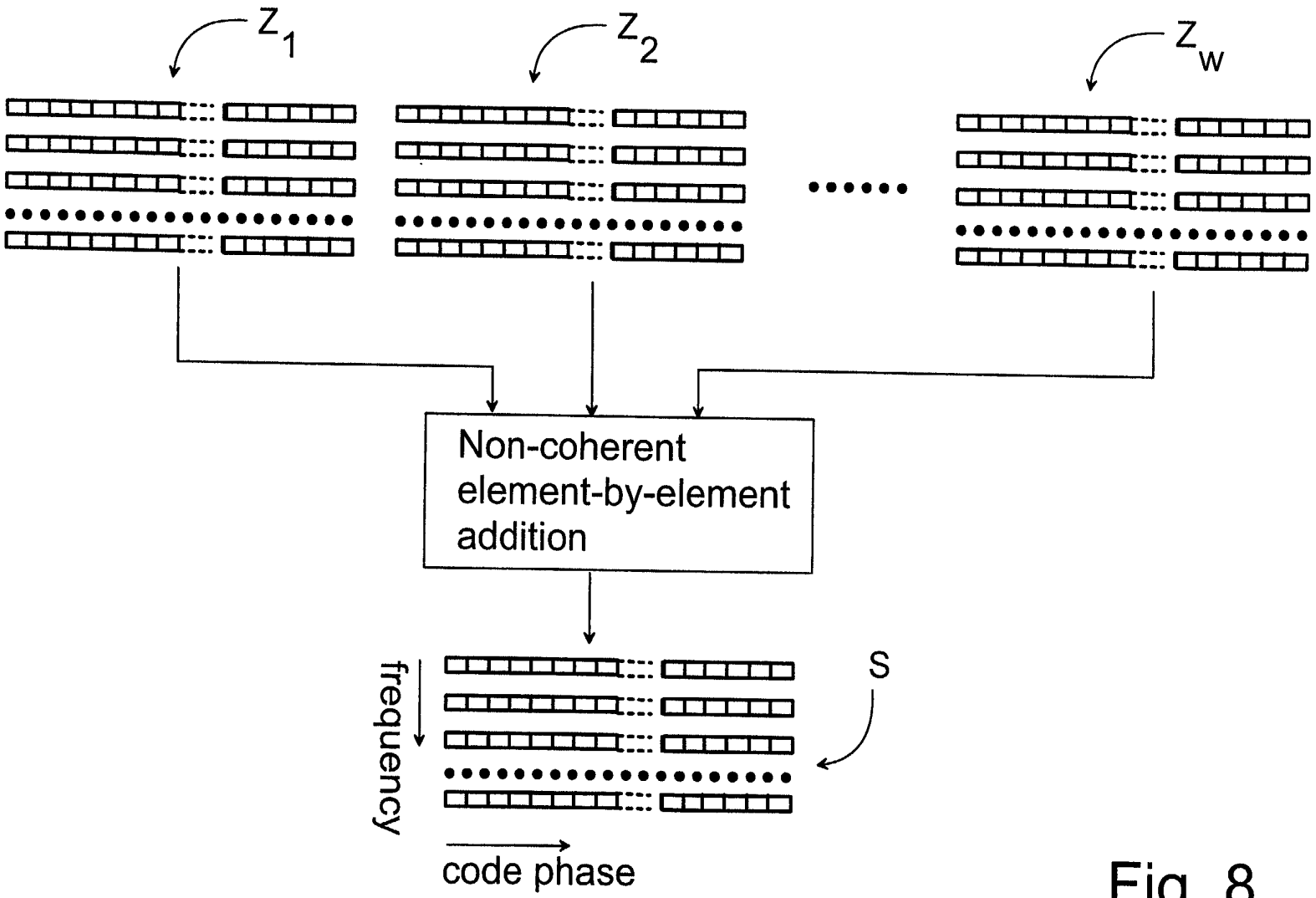
Z1
Z2
Zw
Non-coherent
element-by-element
addition
S
frequency
code phase

Fig. 8

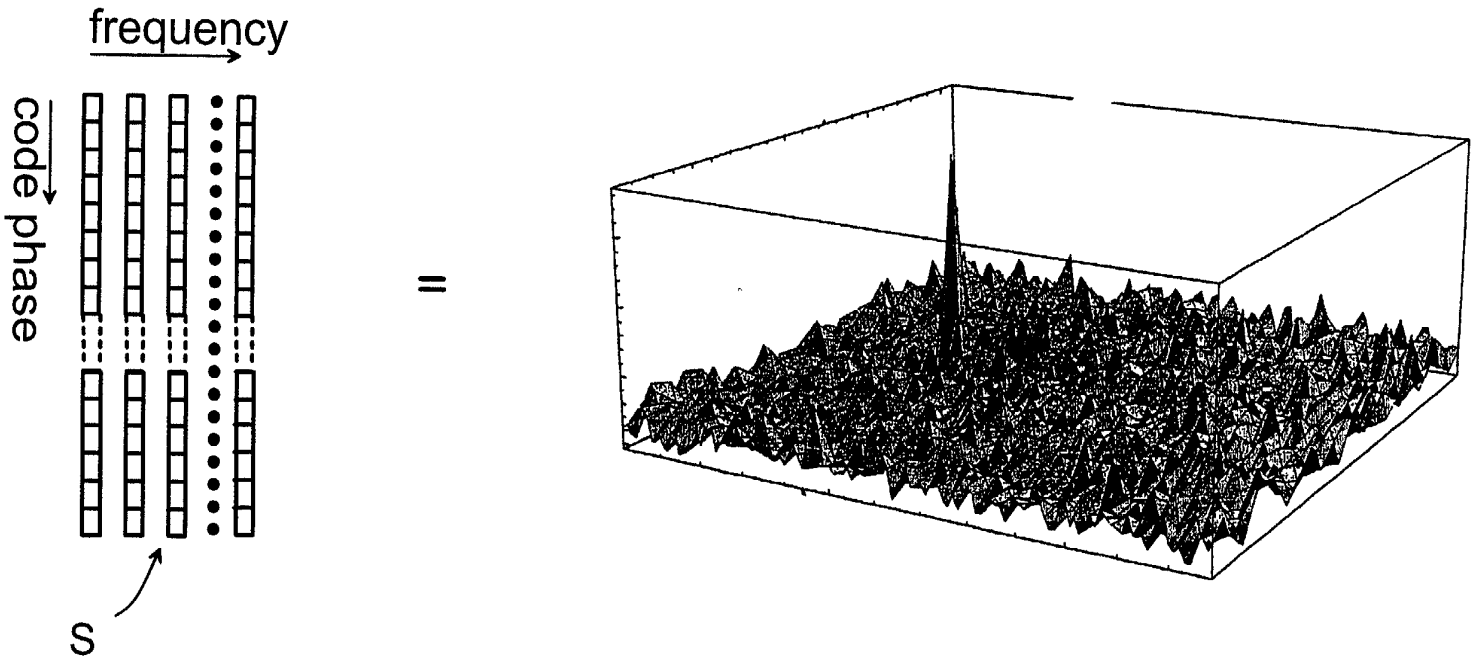

Fig. 9

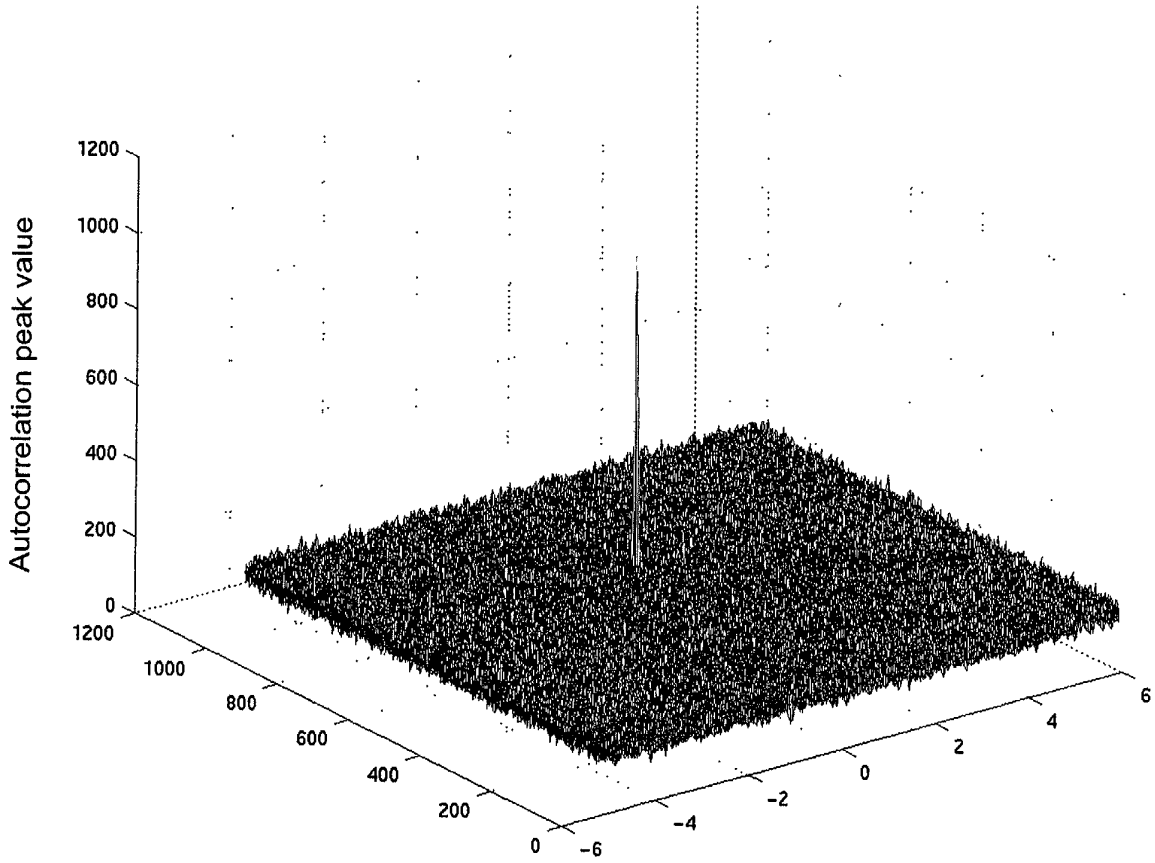
Autocorrelation peak value
1200
1000
800
600
400
200
0
1200
1000
800
600
400
200
0
-6
-4
-2
0
2
4
6
Code phase in [0...1023] range
Doppler frequency in [-5...6] kHz range

Fig. 10

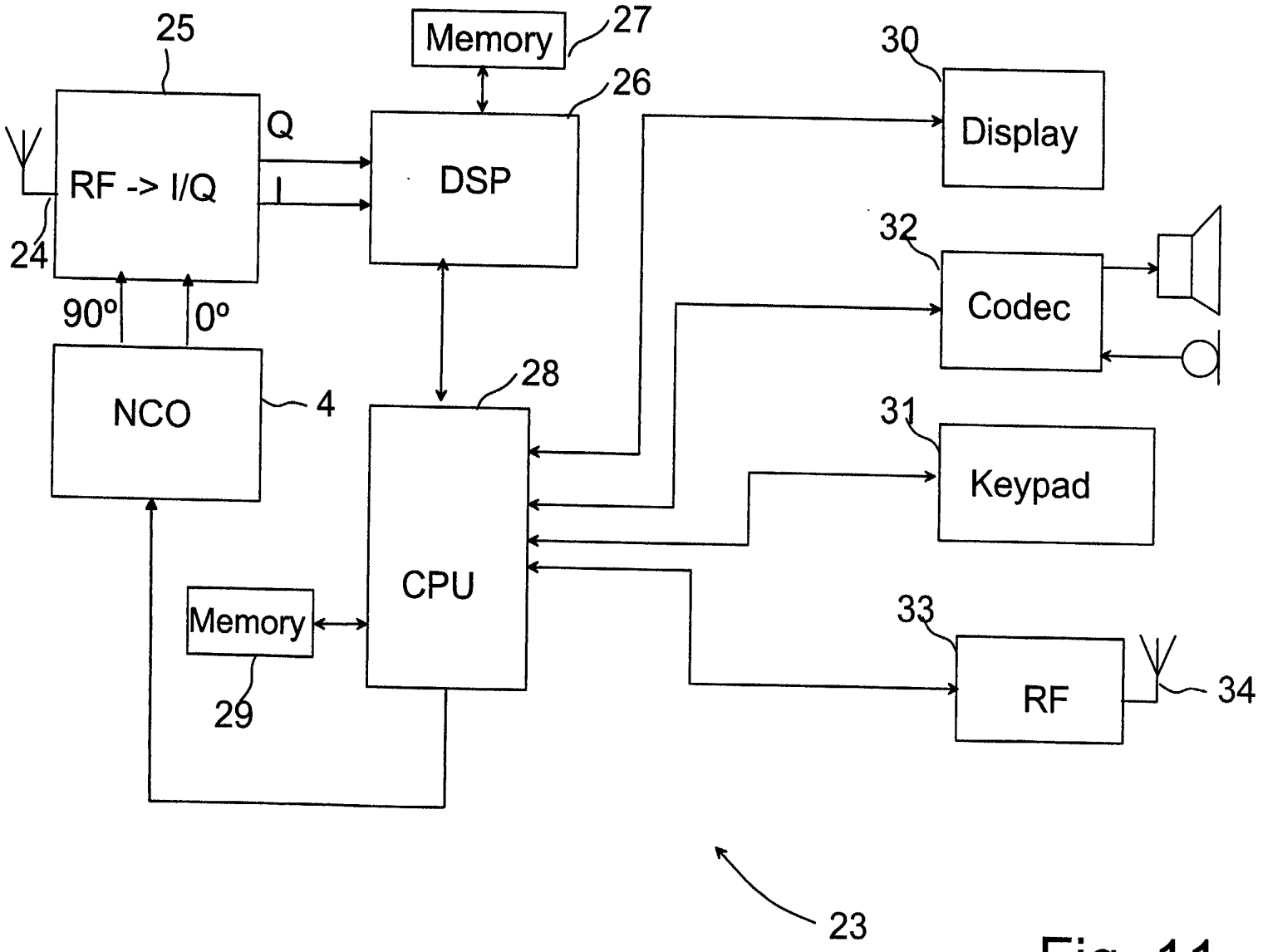
25
Memory
27
26
30
Display
Q
RF -> I/Q
DSP
I
24
32
Codec
90°
0°
NCO
4
28
31
Keypad
CPU
Memory
33
RF
34
29
23

Fig. 11